



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/580,695	05/30/2000	Kenneth J McCullough	950-009252-US (PAR)	2173
	7590 04/30/2004		EXAMINER	
David Aker Esq. Perman & Green LLP 425 Post Road Fairfield, CT 06430			LEUNG, JENNIFER A	
			ART UNIT	PAPER NUMBER
			1764	
DATE MAILED: 04/30/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

AS

Office Action Summary	Application No. 09/580,695	Applicant(s) MCCULLOUGH ET AL.	
	Examiner Jennifer A. Leung	Art Unit 1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 May 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Applicant's amendment submitted on January 28, 2004 has been received and carefully considered. Claims 1-25 remain active.

Claim Objections

2. Claim 2 is objected to because of the following informalities:

The phrase, "said second fluid passages comprise, are located..." in lines 2-3 should be corrected for proper grammatical form.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 2 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Orr (US 3,727,620).

Regarding claims 1 and 2, Orr discloses an apparatus comprising:

a shaft (i.e., rod-like handle **27**);

a generally circular chuck member (i.e., central hub **26** of basket **13**; FIG. 1), said shaft **27**

extending from a first surface of said chuck member (i.e., the bottom surface), the chuck member having first fluid passages directing a fluid through the chuck and toward the sample **12** (i.e., via "a series of slots and webs forming an open grill work construction"

Art Unit: 1764

of basket **13**; column 2, lines 46-57) and second fluid passages directing the fluid away from the sample **12** (i.e., the plurality of grooves located at periphery **41** of basket **13**, inherently propelling fluid away from sample **12** via openings **42** of rotary member **16** upon rotation of shaft **27**; column 3, lines 21-23; FIG. 1, 2);

a sample holder associated with a second surface of chuck member (i.e., the molded supports (unlabeled) of basket **13**, which support the wafers “so as not to scratch or otherwise mar their faces,” column 2, lines 46-68; FIG. 1), the second surface (i.e., the top surface) being opposite the first surface, said sample holder being disposed to hold the sample **12** with a predetermined surface in a predetermined orientation relative to the fluid flow (i.e., “with their faces upstanding about a vertical axis,” and radially about a central hub **26**; column 1, lines 54-65 and column 2, lines 51-54); and

a sample receiving assembly for holding sample **12** so that it remains fixed to the sample holder with the predetermined surface in the predetermined orientation when shaft **27** rotates and causes the chuck member and sample holder to rotate with the shaft **27** (i.e., rotary member **16** having an annular ring **37** provides a complementary seat for maximum support of the basket **13** during spinning operation; column 3, lines 15-30).

Regarding claim 25, the same comments with respect to Orr apply (see claim 1 above).

Orr (column 3, line 61 to column 4, line 4; column 4, lines 23-35) further discloses a reactor chamber (i.e., tub **18**; FIG. 4) for receiving the chuck assembly; a spindle assembly (i.e., comprising drive shaft **28**; FIG. 4) for receiving an end of shaft **27** distal from chuck member **26**; and a motor (i.e., motor **77**; FIG. 2) for rotating spindle assembly **28** and shaft **27**.

Instant claims 1, 2 and 25 structurally read on the apparatus of Orr.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 3-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Orr (US 3,727,620) in view of in view of Risse (US 3,986,704).

Regarding claim 3, Orr discloses by illustration a generally “squat cylinder” for the chuck member (see FIG. 1), wherein the second fluid passages comprise a plurality of straight grooves extending along the outer surface 41 of the cylinder, inherently propelling the fluid against the wall of chamber 18 upon rotation of shaft 27. However, Orr is silent as to the grooves being at an acute angle with respect to a longitudinal axis of the chuck member. In any event, it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to modify the grooves in the apparatus of Orr to comprise acute angle grooves, on the basis of suitability for the intended use, because the configuration of angled grooves for fluid agitation and propelling devices are conventionally known in the art, as evidenced by Risse. Risse teaches a fluid propelling device comprising a circular member 12 having a plurality of

Art Unit: 1764

grooves at its periphery, as defined by slot conduits **14**. Risse further suggests that acute angled grooves may be substituted for straight grooves by teaching, “the slots forming conduits **14** may have different relative positionings and/or configurations. For instance, the slots may have rectangular configurations and parallel dispositions with respect to motor shaft **10**, as indicated by reference number **20**, [i.e., straight grooves]. Also, they may have curved, generally helical configurations and dispositions as indicated by reference numeral **22**, [i.e., acute angle grooves],” (column 2, lines 52-59).

Regarding claim 4, the first fluid passages inherently comprise openings that extend through the chuck member in a direction parallel to its longitudinal axis, as evidenced by the “series of slots and webs forming an open grill work construction,” (column 2, lines 46-53).

Regarding claim 5, the same comments with respect to Orr apply (see claim 25 above).

Regarding claim 6, Orr discloses the chamber of tub **18** is cylindrical (see FIG. 1), wherein the fluid will inherently flow along the wall in a second direction by virtue of the centrifugal force propelling the fluid adhered to samples **12** to the wall upon rotation of shaft **27** by motor **77**, in the modified apparatus.

Regarding claim 7, Orr discloses a first opening for introducing reaction fluid (i.e., via inlets **43** or **44**; column 3, lines 30-46) and a second opening through which the reaction fluid is removed from the chamber **18** (i.e., via a drain opening **69**; column 4, lines 17-22).

Regarding claim 8, Orr disclose first opening **43** being disposed proximate shaft **27**, and second opening **69** being disposed proximate the wall of chamber **18** (see FIG. 2).

5. Claims 9-11 and 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Orr (US 3,727,620) in view of Risse (US 3,986,704), as applied to claims 1-5 above, and further

in view of Mielnik et al. (US 5,526,834).

The apparatus of Orr is utilized for cleaning thin wafers, such as those used for microelectric substrates in semiconductive devices and the like, using streaming deionized water and dry nitrogen (column 1, lines 1-8, 54-65). Orr is silent as to the device being capable of cleaning the thin wafers under varied temperature and/or pressure conditions, such as under supercritical fluid conditions.

Mielnik et al. teaches that the general concept of cleaning semiconductive devices and the like with supercritical fluids is known in the art. (column 1, line 53 to column 2, line 16). Mielnik et al. applies this cleaning concept by teaching an apparatus, similar to the apparatus of Orr, comprising a reactor chamber (i.e., work zone 45; FIG. 2) for containing a means, such as a mesh basket, a series of racks or shelves or other arrangement, for holding the parts to be cleaned (column 4, lines 60-64). In order to generate the supercritical fluids, the apparatus further comprises a temperature control means (i.e., controlled heater 46) and a pressurizing apparatus (i.e., pump 12 to inlet 15, for supplying pressurized carbon dioxide 10 in liquid state); (column 5, lines 17-34; column 6, lines 27-55).

It would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the apparatus of Orr to comprise the recited temperature control means and pressurizing apparatus, on the basis of suitability for the intended use, since the temperature control means and pressurizing apparatus would enable the apparatus of Orr to generate supercritical carbon dioxide for cleaning substrate samples 12, this being particularly advantageous because carbon dioxide is a non-polar, benign cleaning solvent capable of being used with other solvents, for producing enhanced cleaning especially when raised to supercritical

Art Unit: 1764

temperatures and pressures, as taught by Mielnik et al. (column 1, lines 37-52).

6. Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Orr (US 3,727,620).

The same comments with respect to Orr apply. However, Orr is silent as to the sample holder comprising a rectangular plate. In any event, it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to select another, suitable shape for the sample holder (i.e., such as the recited rectangular shape for the current circular shape) in the apparatus of Orr, on the basis of suitability for the intended use, since it has been held that changes in shape merely involves ordinary skill in the art.

7. Claims 12-14, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Orr (US 3,727,620), as applied to claim 1 OR claims 1, 21 and 22 above, and further in view of Thompson et al. (US 5,224,503).

Orr discloses sample receiving assembly 16, "has an inside diameter 39 corresponding to the diameter 41 to the periphery of the basket and provides a complementary seat for maximum support therefor during the spinning operation," (column 3, lines 15-30) wherein, "these baskets are preferably molded from a Teflon-like plastic and support the wafers so as not to scratch or otherwise mar their faces," (column 2, lines 59-64). Thus, the apparatus inherently comprises a support means for fastening sample to the sample receiving assembly, such that the sample 12 is not marred or scratched, and such that the sample 12 is oriented with its face upstanding about a vertical axis during a spinning operation. Orr is silent as to whether the support means may instead comprise a clip for holding the sample 12 to the sample holder and a fastener for securing the clip to the sample holder. In any event, it would have been obvious for one of ordinary skill

Art Unit: 1764

in the art at the time the invention was made to substitute a clip and fastener arrangement for the support means in the apparatus of Thompson et al., since it has been held that the substitution of known equivalent structures only involves ordinary skill in the art. A known sample receiving assembly that utilizes a clip and fastener arrangement for securing the sample to the sample holder is taught by Thompson et al. (column 9, line 58 to column 10, line 50; FIG. 11). As shown in FIG. 11, the sample receiving assembly supports a plurality of wafers in carrier baskets **214**, wherein the baskets comprise a plurality of through holes and are secured to a rotor cage **71** with a clip (i.e., bracket engaging ends **217**, **218**) and fastener (i.e., mounting brackets **201**, **202**) arrangement, thereby enabling simplified loading and unloading of samples in the cleaning apparatus, as taught by Thompson et al.

Response to Arguments

8. Applicant's arguments filed January 28, 2004 with respect to the rejections of claims 1-7, 9-20 and 25 under 35 U.S.C. 102(b) as being anticipated by Bergman et al., claims 1, 2, 12-14 and 25 under 35 U.S.C. 102(b) as being anticipated by Du Gal, claims 8 and 21-24 under 35 U.S.C. 103(a) as being unpatentable over Bergman et al., and claims 3-6 and 19-24 under 35 U.S.C. 103(a) as being unpatentable over Du Gal in view of Risse, have been fully considered. In view of Applicant's amendments and corresponding arguments, the rejections have been overcome and therefore withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of the newly found prior art references above.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Art Unit: 1764

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

* * *

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is (571) 272-1449. The examiner can normally be reached on 8:30 am - 5:30 pm M-F, every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jennifer A. Leung
April 26, 2004 *JAL*

Hien Tran
HIEN TRAN
PRIMARY EXAMINER